Dec. 10, 1957 C. STORER 2,815,672

PIN WHEEL FEEDING UNIT

Filed March 26, 1953

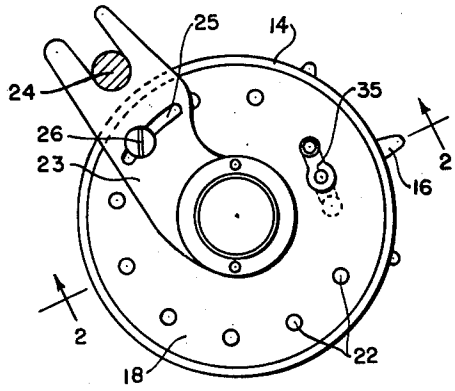


Fig 1

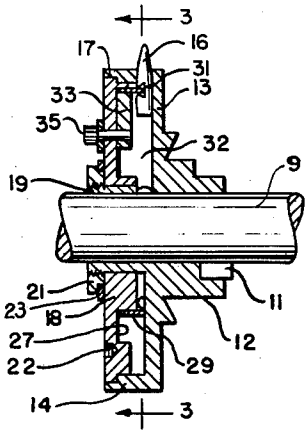


Fig 2

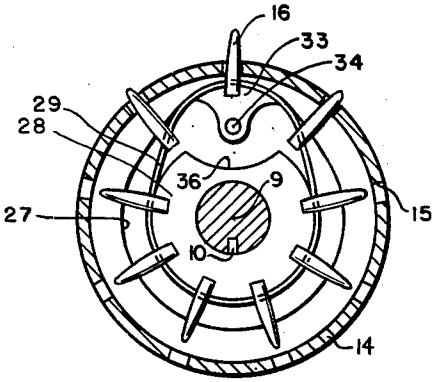


Fig 3

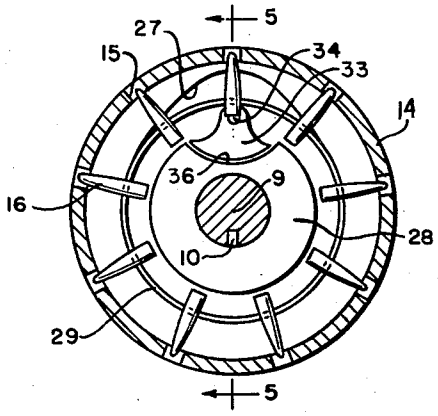


Fig 4

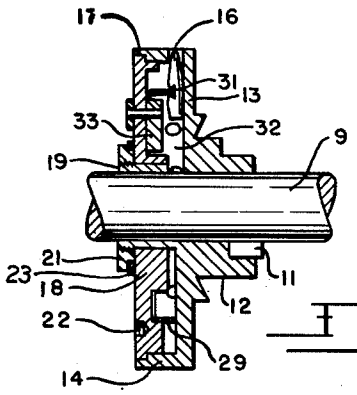


Fig 5

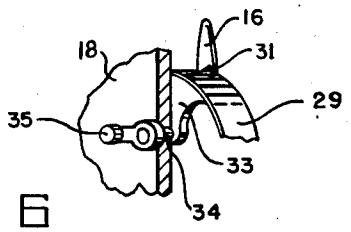


Fig 6

INVENTOR.
CLARK STORER
BY Tom Walker
ATTORNEY

United States Patent Office 2,815,672 Patented Dec. 10, 1957

2,815,672

PIN WHEEL FEEDING UNIT

Clark Storer, Miamisburg, Ohio

Application March 26, 1953, Serial No. 344,700

15 Claims. (Cl. 74—243)

(Filed under Rule 47(b) and 35 U. S. C. 118)

This invention relates to strip feeding devices, and more particularly to pin wheel feeds as used in typewriting and like machines to positively feed marginally punched manifold stationery.

In pin wheel feeding devices of the kind described, it is desirable that each pin wheel feeding unit have an integrated unitary construction, with means being provided for rendering each unit selectively effective and ineffective, and further that each unit may be adjustable so that the feeding pins will protrude only at such circumferential area as is proper or necessary to engage the strip.

The object of the invention is to simplify the construction as well as the means and mode of operation of pin wheel feeding units, whereby such units may not only be economically manufactured, but will be more efficient and satisfactory in use, adaptable to a wide variety of applications, having relatively few parts and be unlikely to get out of repair.

The instant invention proposes a feeding unit having an improved and simplified construction and mode of operation in the above noted respects and it is a general object of the invention to provide a feeding unit so characterized.

Another object of the invention is to provide a feeding unit of the class described adjustable to cause the feeding pins to protrude in any one of a series of circumferential positions and further adjustable to render the feeding unit alternatively effective and ineffective in any of the first mentioned adjustment positions.

A further object of the invention is to utilize in a feeding unit as described a flexible control member for the feeding pins which can be deformed as desired to effect extension of the feeding pins in any desired circumferential area and which further may be permitted to assume a normal or neutral condition in which none of the feeding pins are projected or extended.

Still another object of the invention is to present a generally new strip feeding device of unusual simplicity of operation and accessibility of adjustment.

A further object of the invention is to provide a pin wheel feeding unit possessing the advantageous structural features, the inherent meritorious characteristics and the mode of operation herein mentioned.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation, as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

Referring to the accompanying drawing, wherein is found the preferred but obviously not necessarily the only form of embodiment of the invention,

Fig. 1 is a view in end elevation of a feeding unit in accordance with the illustrated embodiment of the invention;

Fig. 2 is a view in longitudinal section taken substantially along the lines 2—2 of Fig. 1;

Fig. 3 is a view in cross section taken substantially along the lines 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 3 showing the feeding unit in neutral or ineffective position.

Fig. 5 is a view like Fig. 2, showing the parts as positioned in Fig. 4; and

Fig. 6 is a detail view in perspective of the cam lever adjusting means.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawings, a fragment of a shaft 9 is shown, which shaft may serve as a platen support and be suitably mounted in the carriage of a typewriting machine or the like for rotary motion. Mounted on the shaft 9 is a pin wheel feeding unit and it will be understood that a strip feeding apparatus may comprise one or a plurality of such feeding units.

The shaft 9 is formed with a keyway 10, a key 11 being received in the keyway 10 and serving to connect a pin wheel body 12 to the shaft 9 for unison rotary and relative axial motion. The body 12 includes a radial wall 13 terminating in an out turned flange 14 lying in a plane parallel to the shaft 9. The flange 14 has a series of radial holes 15 receiving feeding pins 16 which are thus radially disposed about a common center represented by the longitudinal axis of the body 12. The pins 16, as will be seen, are adapted and arranged for progressive extending and retracting radial motion relatively to the body 12 for feeding engagement with a strip of material in overlying relation to the flange 14.

The holes 15 are positioned at the inner end of the flange 14, or that end adjacent to the radial wall 13. The opposite or outer end of the flange 14 is formed with countersink 17 in which is seated a peripheral flange on a disc 18. The disc 18 has a central opening receiving a bushing 19 which is an integral sleeve-like extension of the body 12 and a threaded portion on which a nut 21 is installed externally to the disc 18, it being understood that the nut 21 serves to hold the disc 18 to a seat in the countersink 17.

In the outer face thereof, the disc 18 has a circumferential series of tapped recesses 22. Rotatably mounted on the nut 21 is an arm 23 which extends radially of the shaft 9 and is forked at its outer end to engage a cross rod 24 which is a fixed part of the typewriter carriage. Intermediate its ends, the arm 23 is formed with a slot 25 occupying the same relative radial position as the tapped recesses 22. Mounted in the slot 25 is a set screw 26. If the screw 26 is allowed to enter any one of the tapped recesses 22 and is then tightened down upon the arm 23 it will be evident that the result is to hold the disc 18 against rotary motion relative to the arm 23.

The internal face of the disc 18 is formed with a generally annular groove 27 having the eccentric shape shown in Figs. 3 and 4 and defining a central boss 28. Received in the groove 27, in surrounding relation to the boss 28, is a control member for the feeding pins 16 in the form of a relatively broad flexible band 29 made of flat spring steel. One side edge of the band 29 projects beyond the boss 28 and has a common engagement with the feeding pins 16, being received in transverse notches 31 thereof. The feeding pins 16 are received in radial grooves 32 in the wall 13 of the body 12, and may move radially in such grooves under the influence of the control band 29 in response to rotary motion of the body 12 relative to the disc 18.

The band 29 tends normally to occupy the position shown in Fig. 4 wherein it has a circular formation and is approximately concentric with respect to the shaft 9. With the band 29 so formed there is little or no radial

motion of the feeding pins 16 in response to rotation of the body 12 and it may be further noted that in this position of the parts and the feeding unit is ineffective since none of the pins 16 project through the openings 15 or above the surface of the flange 14.

The feeding unit is rendered effective through adjustment of a cam lever 33 which is mounted on a pin 34 extending through the disc 18 and connected outside the disc 18 to a small finger operated lever 35. The lever 33 is shaped substantially as a segment of a disc with the outer surface thereof defining an arc corresponding to the normal curvature of the band 29. As shown in Fig. 4, the lever 33 may be received in a cut out portion 36 of the boss 28 and when so positioned is ineffective with respect to the band 29. Through manipulation of the lever arm 35, however, the lever 33 may be rotated through a distance of about 180° to the position shown in Fig. 3, in the course of which motion the lever 33 engages the band 29, moving it first to engage a part of the band with the boss 28 and then elongating the diametrically opposed portion of the band into the eccentric portion of the groove 27 to produce the eccentric shape illustrated in Fig. 3. With the control band 29 so positioned, a relative rotary motion of the body 12 carries the feeding pins 16 about the control band which projects and retracts the pins in a progressive manner within a localized area which may be termed the area of pin extension.

Such area of extension may be predetermined to occur in any circumferential portion of the flange 14. To change such area of extension, the set screw 26 is loosened and the disc 18, carrying the lever 33, is turned relatively to the body 12 to the desired position. Such movement will bring one or another of the tapped openings 22 of the disc 18 within the area of the slot 25. The adjustment screw 26 can be inserted in such opening and tightened as before described. The disc 18, since it supports the band 29 and the lever 33, may be termed a support means.

A plurality of control operating positions thus are possible so that the feeding pins will protrude at the proper place to engage the strips, and it will be understood that in any of these selected positions the feeding unit may be rendered effective or ineffective through adjustment of the lever 33 between the positions shown in Figs. 3 and 4.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect.

Having thus described my invention, I claim:

1. A pin wheel feeding device, including a plurality of pins radially disposed about a common center and revoluble about said center, a rotatable body having radial openings receiving said pins, a ring-shaped continuous band made of a resilient deformable material in surrounding relation to said center, said band being engaged with said pins and acting as a guide in the revolving motion of said pins, means for applying a radial deforming pressure to said band to impart an eccentric shape thereto, and support means for said band and for said pressure applying means stationary relatively to said body.

2. A pin wheel feeding device, including a plurality of pins radially disposed about a common center and revoluble about said center, a rotatable body having radial openings receiving said pins, a resilient deformable ring-shaped continuous guide band for said pins, pressure applying means for flexing said guide band along selected radial lines, and support means for said band and for said pressure applying means stationary relative to said body.

3. A pin wheel feeding device, including a rotatable pin wheel body having radial openings therein, feeding pins slidingly received in said openings and revolving about the axis of said body in response to rotation thereof, a continuous eccentric cam guiding said feeding pins in a progressive retracting and extending radial motion in conjunction with rotation of said body, said cam being made of a resilient material deformable to vary the areas of extension and withdrawal of said pins relatively to said body, support means for said cam stationary relatively to said body, and means on said support means for deforming said cam.

4. A pin wheel feeding device, including a rotatable pin wheel body having radial openings therein, a series of feeding pins received in said openings for revolving motion about the axis of said body in response to rotation of the body and capable of radial sliding motion relatively to said body, a ring-shaped continuous guide in surrounding relation to the axis of said body controlling the radial sliding motion of said feeding pins, said guide being made of a resilient material and tending normally to assume a cylindrical formation inhibiting radial motion of said pins, means for effecting a localized deforming of said guide to impart a cam shape thereto effecting progressive extending and retracting radial movements of said feeding pins in conjunction with rotation of said body, and support means for said guide and for said last named means stationary relatively to said body.

5. A pin wheel feeding device, including a cylindrical pin wheel body having radial openings therein, a plurality of pins radially disposed about a center concentric with the axis of said body and received in said radial openings to project above the peripheral surface of said body, a continuous flexible guide band cooperatively engaged with said pins and in surrounding relation to the axis of said body, means for distorting said band into the shape of a cam for successively extending and withdrawing said pins relatively to the surface of said body, and support means for said band and for said last named means stationary relatively to said body.

6. A pin wheel feeding device according to claim 5 characterized by means for adjusting said support means in a rotary sense relatively to said body.

7. A pin wheel feeding device, including a plurality of pins radially disposed about a common center, said pins being carried about said common center in response to rotation of said body, a continuous flexible guide band in surrounding relation to said center and cooperatively engaged with said pins, means for distorting a selected area of said band producing a cam for extending and withdrawing said pins in conjunction with the revolving motion thereof, and support means for said band and for said last named means stationary relatively to said body, said support means being adjustable in a rotary sense relatively to said body.

8. A pin wheel feeding device according to claim 7, characterized in that said means includes a pressure applying element in adjacent relation to said band and revolubly adjustable about said common center in accompaniment with adjustment of said support means in a rotary sense.

9. A pin wheel feeding device, including a plurality of pins radially disposed about a common center and adjustable to effective and ineffective positions, a rotatable body having radial openings receiving said pins, a continuous flexible guide control band for said feeding pins adjustable to alternate positions of control in one of which it has a cylindrical formation and in the other of which it

has an eccentric formation, support means for said band stationary relatively to said body, and means on said support means for adjusting said control band.

10. A pin wheel feeding device, including a plurality of feeding pins radially disposed about a common center, a rotatable body having radial openings receiving said pins, a continuous flexible guide control band for said feeding pins concentric with respect to said carrier and normally assuming a contracted cylindrical formation, means for distorting selected portions of said band to produce eccentric cam shapes therein, and support means for said band and for said last named means stationary relatively so said body.

11. A pin wheel feeding device, including a rotatable pin wheel body having radial openings, a plurality of feeding pins slidingly received in said openings and radially disposed about the axis thereof, a continuous flexible guide control band for said feeding pins in approximately concentric relation to said body, means for applying a radial pressure to said band in a localized area thereof to cause said band to assume an eccentric shape, said means being selectively operable to apply and to release such pressure, and support means for said band and for said means stationary relatively to said body.

12. A pin wheel feeding device according to claim 11, characterized in that said support means includes a mounting for said pressure applying means adjustable to a plurality of rotative positions of adjustment relatively to said body.

13. A pin wheel feeding device, including a rotatable pin wheel body having radial openings therein, a plurality of feeding pins slidingly received in said openings and radially disposed about the axis thereof, a relatively stationary plate adjustable to a plurality of rotative positions of adjustment relatively to said body, said plate having a central boss in concentric relation to said body, a continuous flexible band in surrounding relation to said boss and interengaged with said feeding pins as a guide for said pins, and a cam lever rotatably mounted on said plate and extending between said boss and said band, said lever being adjustable from a first to a second position to apply a localized radial deforming pressure to said band and adjustable back to said first position to release such pressure.

14. A pin wheel feeding device, including a pin wheel body, a circumferential series of radial openings in said body, feeding pins slidingly received in said openings, a circular continuous flexible band supported in normally concentric relation to said body and in guiding relation to said pins, said body and said band being relatively rotatable whereby to carry said pins in a path normally concentric with respect to said body, means for deforming said band to create an eccentric path of movement of said pins, and support means for said band and for said last named means stationary relatively to said body.

15. A pin wheel feeding device, including a rotatable body having peripheral openings therein, a series of feeding pins slidingly received in said openings, control means for said pins including a normally circular, continuous flexible band and an eccentric form into which said band may be deformed, a support for said band and said form normally stationary relatively to said body and adjustable in a rotary sense with respect thereto, and means on said support for deforming said band into said eccentric form.

References Cited in the file of this patent

UNITED STATES PATENTS

1,974,368	Sherman	Sept. 18, 1934
2,000,650	Sherman	May 7, 1935
2,102,651	Sherman et al.	Dec. 21, 1937
2,112,833	Dybvig	Apr. 5. 1938
2,268,891	Mueller	Jan. 6, 1942
2,487,870	Harrison	Nov. 15, 1949